CLAIMS

What is claimed is:

1   1. A method for preparing a region of an electronic document for printing on a printing

2   system having asymmetric misregistration behavior, comprising:

3   trapping the region asymmetrically to compensate for asymmetric misregistration

4   behavior of the printing system.

1   2. The method of claim 1, wherein the region is an entire page or a portion of a page

2   represented in a page description language.

1   3. The method of claim 1, wherein the region is an entire page or a portion of a page

2   represented as a raster.

1   4. The method of claim 1, further comprising:

2   defining an asymmetric transformation;

3   applying the asymmetric transformation to the region to generate a transformed

4   region;

5   processing the transformed region to generate transformed traps; and

6   applying an inverse transformation to the transformed traps to generate traps for the

7   region, the inverse transformation being an inverse of the asymmetric transformation.

1   5. The method of claim 4, wherein the asymmetric transformation is defined as a

2   transformation matrix and the inverse transformation is defined as a matrix inverse of the

3   transformation matrix.

1   6. The method of claim 4, wherein defining the asymmetric transformation comprises:

2   obtaining a first trap width magnitude and direction, the first trap width being a

3   minimum trap width for the printing system;

4   obtaining a second trap width magnitude and direction, the second trap width being a

5   maximum trap width for the printing system;

6   defining a rotational component of the asymmetric transformation by determining an

7   angle by which a first axis of a device space has to be rotated to be aligned with the first trap

8   width direction; and

9   defining a scaling component of the asymmetric transformation according to a ratio of

10   the first trap width magnitude and the second trap width magnitude.

1   7. The method of claim 6, wherein the electronic document is represented in a page

2   description language in a user space and the traps for the region are represented in a device

3   space, the method further comprising:

4   mapping the traps from device space to user space and adding the mapped traps to the

5   page description language representation of the electronic document.

1   8. The method of claim 6, wherein the first trap width direction and the second trap width

2   direction are at right angles to each other.

1   9. The method of claim 6, wherein defining the asymmetric transformation maps a first trap

2   width vector and a second trap width vector to orthonormal basis vectors of a trap-engine

3   space.

1   10. The method of claim 4, wherein processing the transformed region to generate

2   transformed traps is done by a trap engine generating symmetric traps in a trap-engine space.

1   11. The method of claim 4, wherein the step of applying the inverse transformation maps the

2   transformed traps from a trap-engine space to a device space.

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12. The method of claim 4, wherein the electronic document is represented in a page description language in a user space and the traps for the region are represented in a device space, the method further comprising:

mapping the traps from device space to user space and adding the mapped traps to the page description language representation of the electronic document.

13. The method of claim 4, wherein:

the asymmetric transformation maps a resolution-independent representation of the region into a resolution-independent representation of the transformed region;

a vector-based trapping engine processes the transformed region to generate transformed traps represented as vectors; and

the inverse transformation maps the transformed traps represented as vectors to a device space.

14. The method of claim 13, further comprising performing peeker detection and removal in device space before applying the asymmetric transformation.

15. A computer program product, tangibly stored on a computer-readable medium, for preparing a region of an electronic document for printing on a printing system having asymmetric misregistration behavior, comprising instructions operable to cause a computer to:

trap the region asymmetrically to compensate for asymmetric misregistration behavior of a printing system.

16. The product of claim 15, wherein the region is an entire page or a portion of a page represented in a page description language.

17. The product of claim 15, wherein the region is an entire page or a portion of a page represented as a raster.

1 18. The product of claim 15, further comprising instructions to:

2   define an asymmetric transformation;

3   apply the asymmetric transformation to the region to generate a transformed region;

4   process the transformed region to generate transformed traps; and

5   apply an inverse transformation to the transformed traps to generate traps for the

6 region, the inverse transformation being an inverse of the asymmetric transformation.

1 19. The product of claim 18, wherein the asymmetric transformation is defined as a

2 transformation matrix and the inverse transformation is defined as a matrix inverse of the

3 transformation matrix.

1 20. The product of claim 18, wherein the instructions to define the asymmetric

2 transformation comprise instructions to:

3   obtain a first trap width magnitude and direction, the first trap width being a

4 minimum trap width for the printing system;

5   obtain a second trap width magnitude and direction, the second trap width being a

6 maximum trap width for the printing system;

7   define a rotational component of the asymmetric transformation by determining an

8 angle by which a first axis of a device space has to be rotated to be aligned with the first trap

9 width direction; and

10   define a scaling component of the asymmetric transformation according to a ratio of

11 the first trap width magnitude and the second trap width magnitude.

1 21. The product of claim 20, wherein the electronic document is represented in a page

2 description language in a user space and the traps for the region are represented in a device

3 space, the product further comprising instructions to:

4   map the traps from device space to user space and add the mapped traps to the page

5 description language representation of the electronic document.

22. The product of claim 20, wherein the first trap width direction and the second trap width direction are at right angles to each other.

23. The product of claim 20, wherein defining the asymmetric transformation maps a first trap width vector and a second trap width vector to orthonormal basis vectors of a trap-engine space.

24. The product of claim 18, wherein processing the transformed region to generate transformed traps is done by a trap engine generating symmetric traps in a trap-engine space.

25. The product of claim 18, wherein the step of applying the inverse transformation maps the transformed traps from a trap-engine space to a device space.

26. The product of claim 18, wherein the electronic document is represented in a page description language in a user space and the traps for the region are represented in a device space, the product further comprising instructions to:
    map the traps from device space to user space and add the mapped traps to the page description language representation of the electronic document.

27. The product of claim 18, wherein:
    the asymmetric transformation maps a resolution-independent representation of the region into a resolution-independent representation of the transformed region;
    a vector-based trapping engine processes the transformed region to generate transformed traps represented as vectors; and
    the inverse transformation maps the transformed traps represented as vectors to a device space.

28. The product of claim 27, further comprising performing peeker detection and removal in device space before applying the asymmetric transformation.

1   29. A system for preparing a region of an electronic document for printing, comprising:

2   a printing system having asymmetric misregistration behavior; and

3   means for trapping the region asymmetrically to compensate for the asymmetric

4   misregistration behavior of the printing system.

1   30. The system of claim 29, further comprising:

2   means for obtaining a minimum trap width and a maximum trap width defining the

3   asymmetric misregistration behavior of the printing system.